

UPV-312

**A Wisconsin Lake Management
Planning Grant Program
Final Report**

A LAKE MANAGEMENT PLAN FOR



**TOWN OF PALMYRA
JEFFERSON COUNTY, WISCONSIN**

**Developed by the
Board of Commissioners
Blue Spring Lake Management District**

with

**George R. Wood
Lake Management Services
February 1997**

SECTION IV

CHARACTERISTICS OF BLUE SPRING LAKE

There are many characteristics of Blue Spring Lake that help us define the lake and that must be understood if we are to protect it. Broadly speaking, the lake's characteristics can be categorized into "natural features," - like size, flow rates, plants, and fish - and "human-related features," that describe people's activities around, on, and in the lake. The categories are not wholly independent of each other as the natural features of any lake will affect how people use it, and

peoples use can certainly impact the lake's natural features. The main characteristics of Blue Spring Lake that are known will be described in this chapter. Much of the information that follows was taken from the Wisconsin Lake Management Planning Grant Program, Final Report: "An Inventory of Blue Spring Lake," completed in 1995, and which contains more detail than presented here.¹

NATURAL FEATURES

LAKE & WATERSHED

General Features

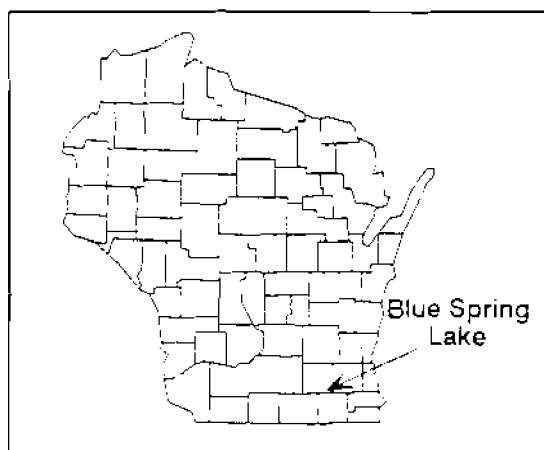
Blue Spring Lake is located in the southeast corner of Jefferson County, Wisconsin, Figure 4.1. The lake is situated at the base of the Kettle

is a section of a USGS 7.5 Minute Series Map showing the lake, its watershed, and the topography of the region.

Physical properties of the lake and watershed are listed in Table 4.1. The lake can be classified as a "Spring Fed, Ground Water Drainage Lake." The lake was formed in 1927-9 when the outflow of a large, natural spring was dammed. This spring is still the major source of water for the lake. The location of this spring is shown on a bathymetric map of the lake, Figure 4.3. While the maximum depth of the lake is no more than 12 feet, the depth of the spring has been measured at 26 feet. The diameter of the spring is estimated to be about 50 feet. The high flow rate of constant, 50 °F water from the spring is usually enough to prevent ice formation over the spring during the winter.

Figure 4.1

LOCATION OF BLUE SPRING LAKE



Moraine Hills, an interlobate glacial moraine formed by the Green Bay and Lake Michigan lobes during the Wisconsin glaciation. Figure 4.2

Watershed Soils

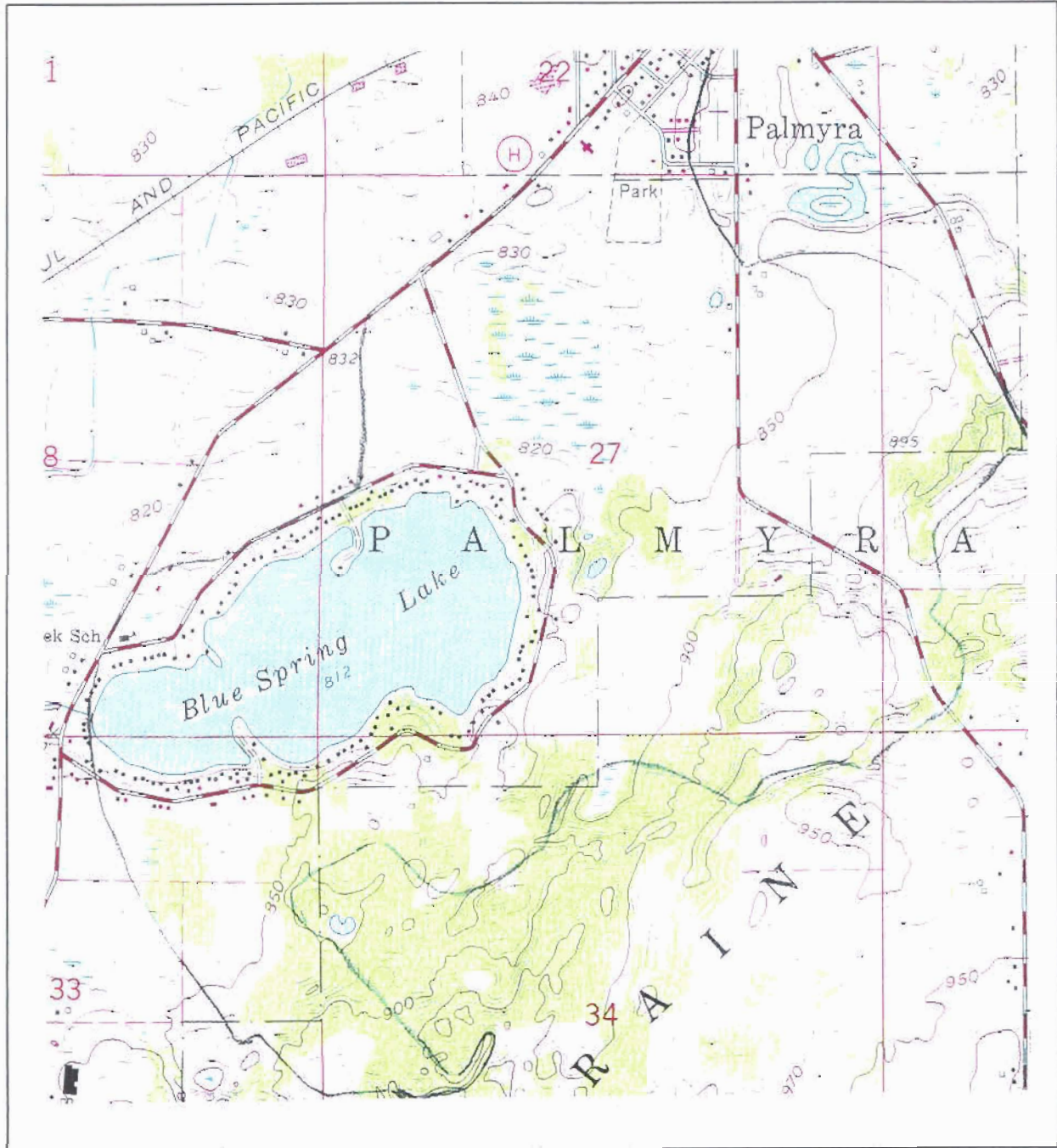
The soils in the watershed are sandy and gravelly, typical of those found near glacial moraines. About 60% of the watershed's soils are considered "well drained to excessively drained" while only 10% of the soils have low water permeation

CHARACTERISTICS OF BLUE SPRING LAKE

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Figure 4.2

BLUE SPRING LAKE, WATERSHED, AND TOPOGRAPHY



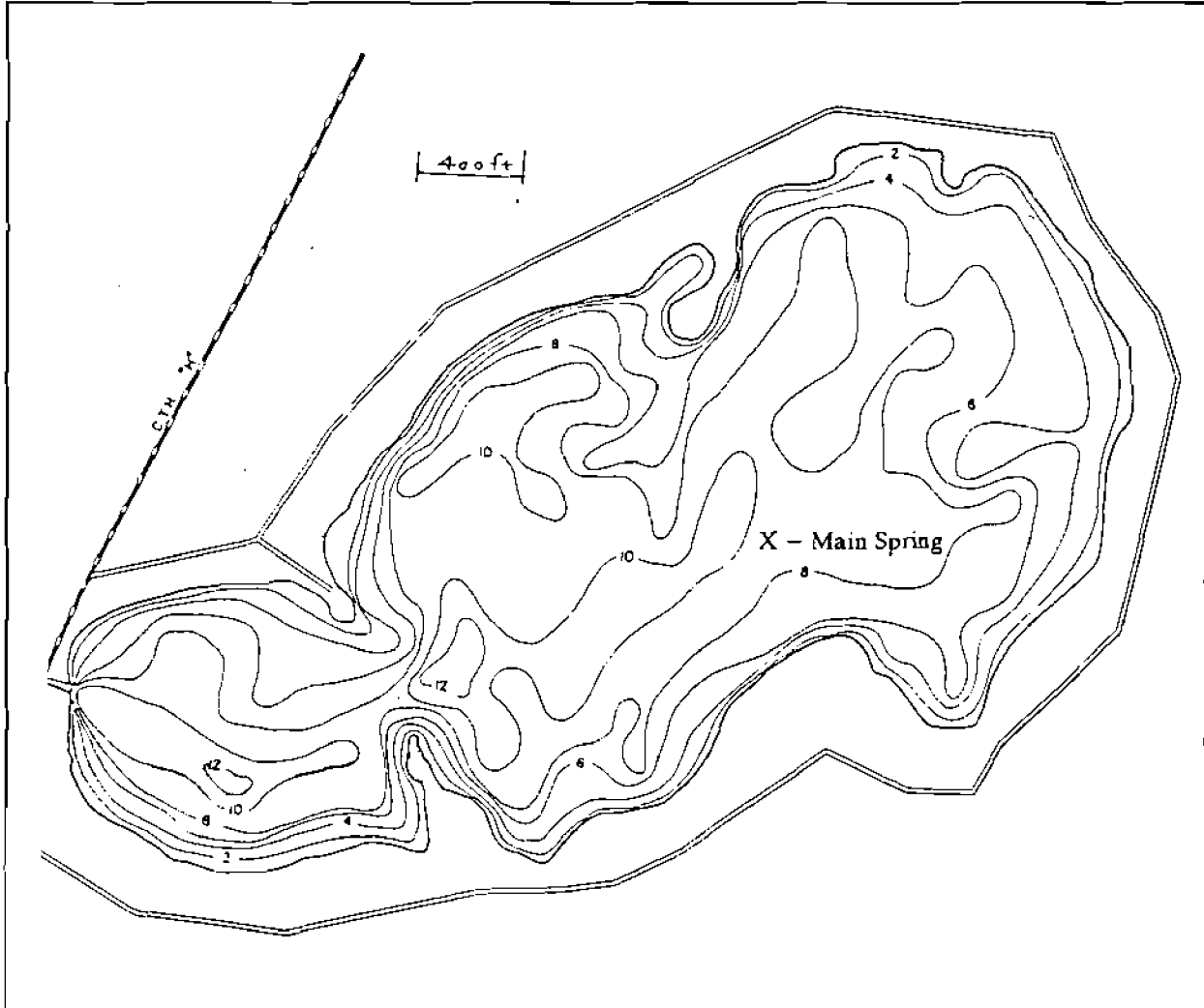
— WATERSHED BOUNDARY

CHARACTERISTICS OF BLUE SPRING LAKE

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Figure 4.3

BATHYMETRIC MAP



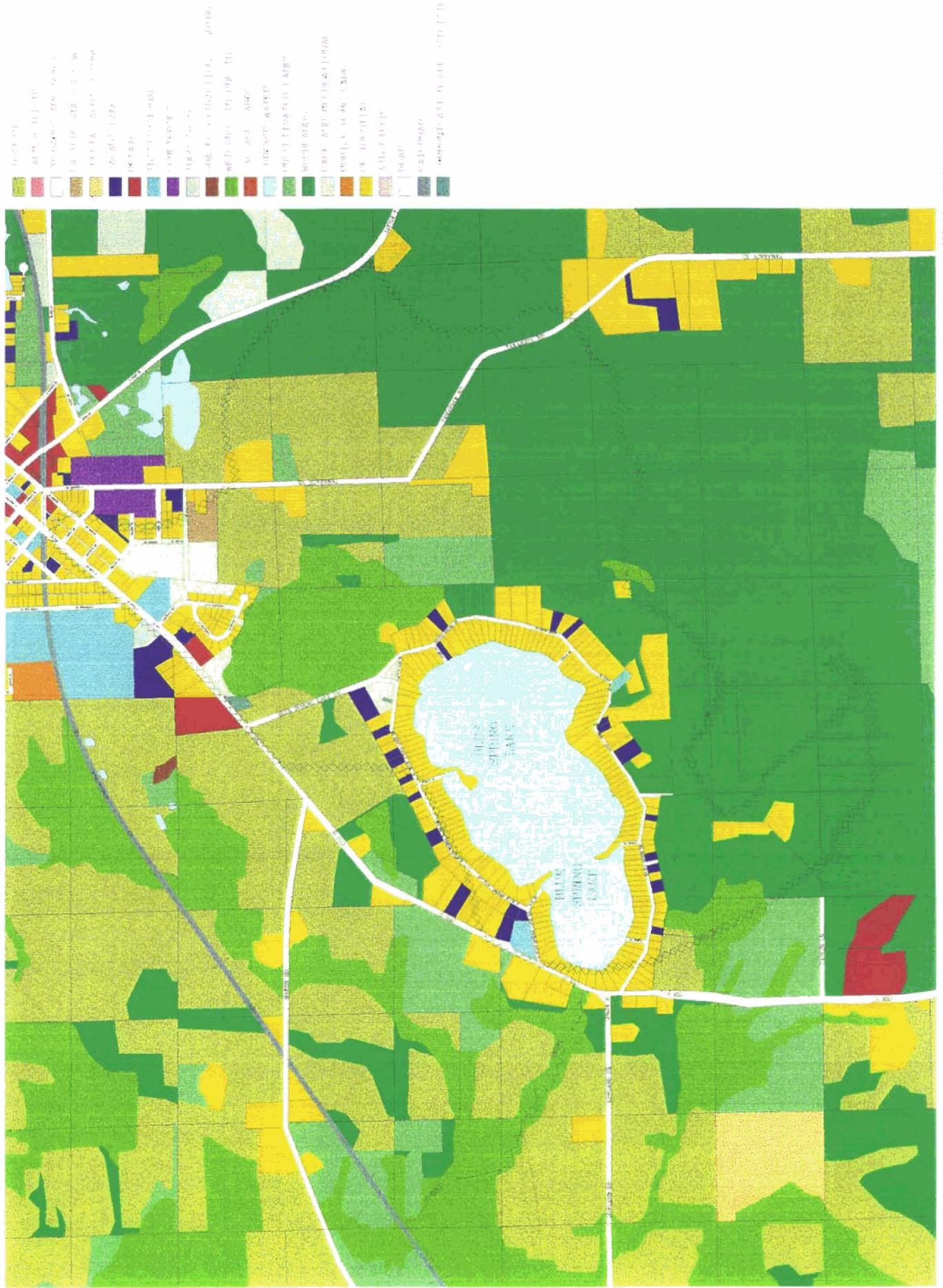
characteristics. This bodes well for Blue Spring lake as the watershed soils tend to take up polluted surface waters, filtering and absorbing nutrients and pollutants.

The lake is further buffered from watershed runoff by the wetlands located on its northeast side. The wetlands slow water runoff during heavy rains, allowing nutrient rich particles to settle and other pollutants to be absorbed by the wetland's plants and soils

Land Uses

Watershed land uses determined in the 1994 inventory are shown in Table 4.1. A more detailed analysis and Geographical Information System (GIS) mapping of land uses has recently been completed by Jefferson County as part of their effort to develop a comprehensive land-use plan for the county. Figure 4.4 shows the results of their land use mapping of the Blue Spring Lake area. The county's new computerized mapping capabilities will be invaluable to future planning

FIGURE 4.4 LAND USES IN THE BLUE SPRING LAKE AREA



CHARACTERISTICS OF BLUE SPRING LAKE

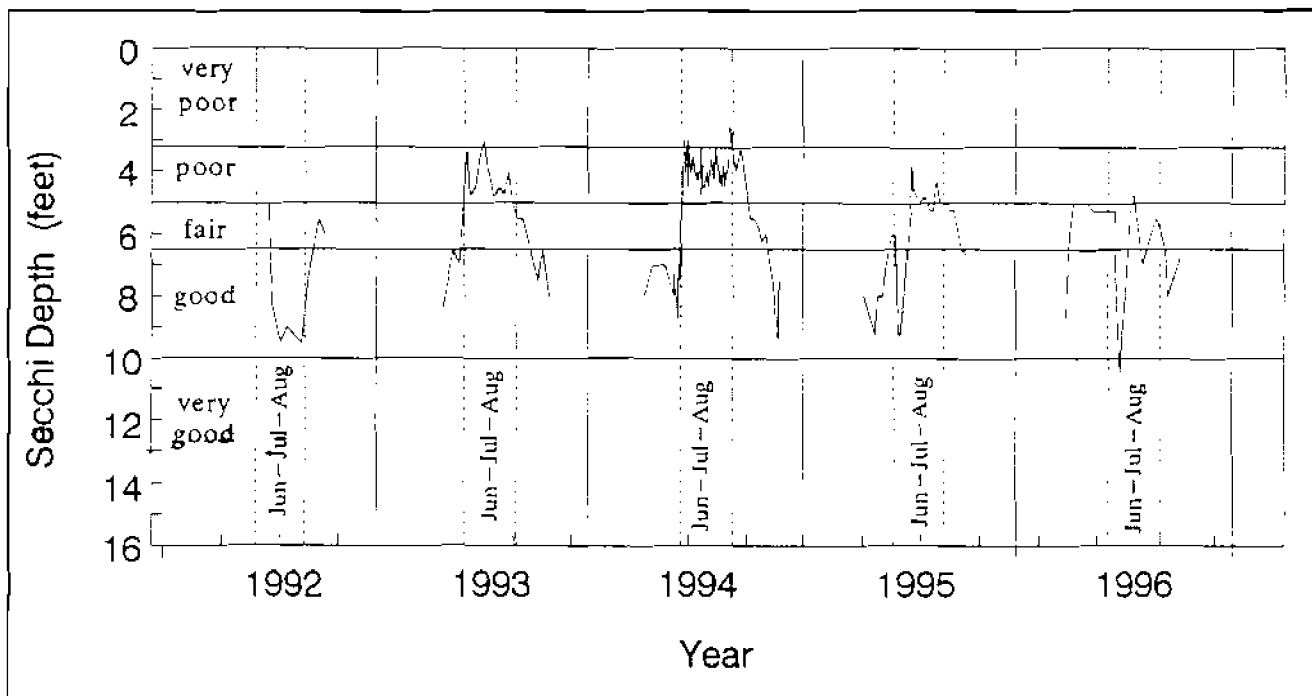
NATURAL FEATURES

on Blue Spring Lake since 1992, primarily due to the efforts of resident and aquatic plant harvester, Jerry Peplinski. These data are plotted in Figure 4.5. Generally, the water clarity decreases during the summer months as algal populations increase from warmer water temperatures, and sediments are disturbed from increased power boating in the shallow lake. This change, however, is not always

consistent from year to year and significant variations have occurred. On average, clarity was quite good in 1992, poor in 1993 and 1994, and improved during 1995 and 1996. In the last two years, short periods of very high clarity occurred. While these recent trends are encouraging, Blue Spring Lake's clarity is still less than about 70% of all Wisconsin lakes.

Figure 4.5

BLUE SPRING LAKE WATER CLARITY, 1992-1996



Trophic State Index Measures

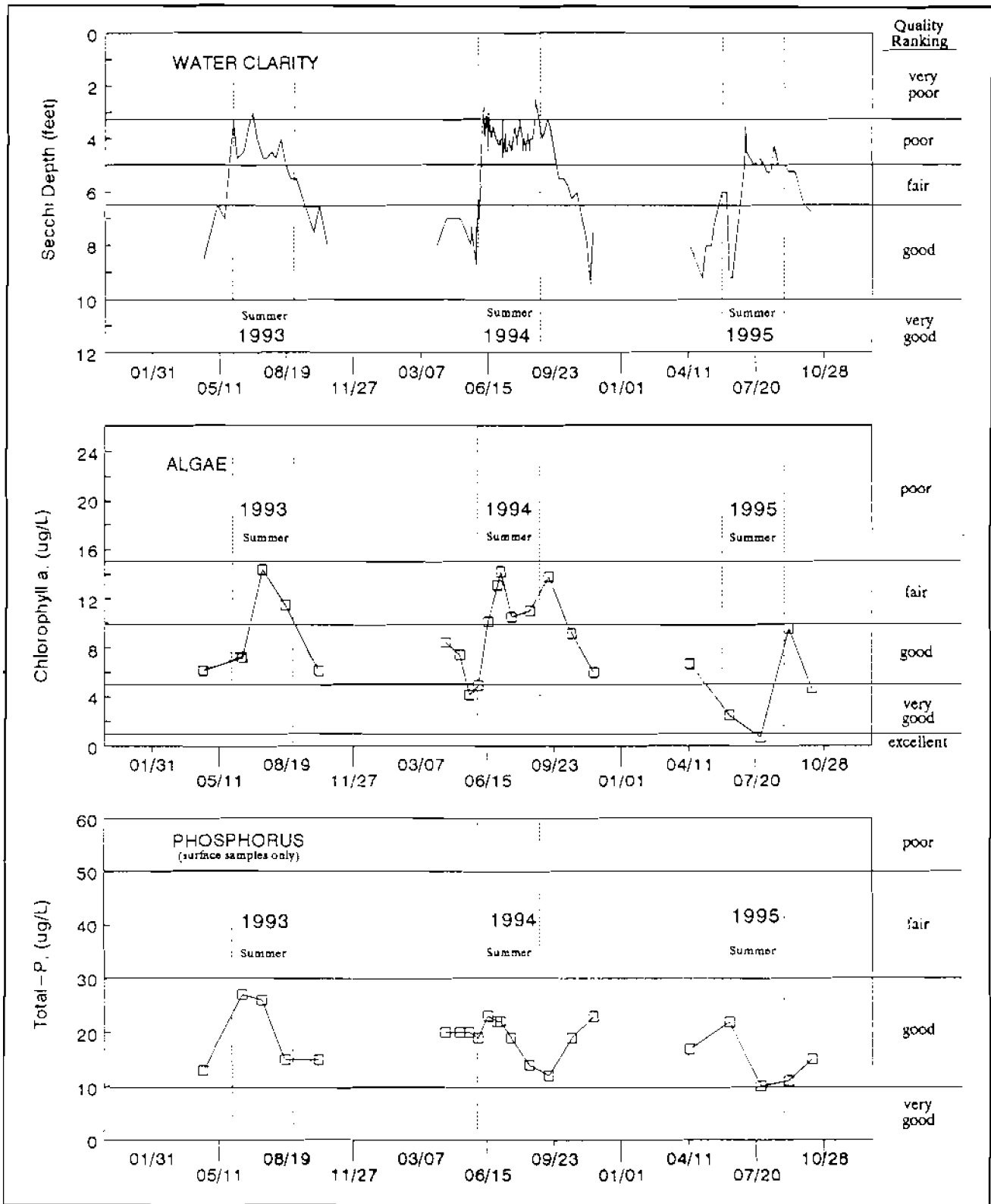
In addition to water clarity, the District's Ecology Committee, mostly through the efforts of Chairman Bill von Rohr, measures phosphorus and chlorophyll-a concentrations in the lake water. These measures, along with Secchi measurements, are part of the DNR's Trophic State Index (TSI) Program which the lake has participated in since 1993. Chlorophyll-a is a

pigment found in green plants and is an indicator of the amount of algae in the water. Phosphorus is a chemical element and an essential nutrient for all life forms. Excessive concentrations of this nutrient are often an indicator of water pollution. These TSI Program measurements are plotted in Figure 4.6 for the years 1993 to 1995. (1996 results for phosphorus and chlorophyll-a were not available at the time of writing this report).

CHARACTERISTICS OF BLUE SPRING LAKE

Figure 4.6

BLUE SPRING LAKE WATER QUALITY, 1993-1995



CHARACTERISTICS OF BLUE SPRING LAKE

Figure 4.7

1927 USGS MAP OF BLUE SPRING LAKE AREA

